BULLETIN

OF

THE JOHNS HOPKINS HOSPITAL.

Vol. IV.—No. 28.] BALTIMORE, JANUARY-FEBRUARY, 1893. [Price, 15 Cents.

CONTENTS.

PAGE.

The Intrinsic Nerves of the Kidney. A Histological Study. By Henry J. Berkley, M. D., - - - - - - - - - 1

Tuberculosis of the Œsophagus. By Simon Flexner, M. D., - 4

Transposition of Viscera. By Theodore Hough, - - - - 8

Proceedings of Societies:

Hospital Medical Society, - - - - - - - - - - 9

Preliminary Report on Aspergillus Mycosis of the Antrum Maxillare [Dr. Mackenzie];—A Case of Tuberculous Pericarditis from Dr. Osler's Wards [Dr. F. R. Smith];—The Question of the Transmission of Syphilis to the Third Generation [Dr. Hewetson];—Peritonitis due to Proteus Vulgaris [Dr. Flexner];—Primary Tuberculosis of the Intestine [Dr. Flexner];—Tuberculosis of Clavicle, Infection of Pleura and Peritoneum, and General Miliary Tuberculosis [Dr. Flexner].

The International Congress of Charities, Correction and Philanthropy, - - - - - - - - - - - - - 14

Notes on New Books, - - - - - - - - - - - - 15

THE INTRINSIC NERVES OF THE KIDNEY—A HISTOLOGICAL STUDY.

(ABSTRACT PAPER.)

By Henry J. Berkley, M. D.

[*Read before the Johns Hopkins Medical Society, December* 5, 1892.]

From a physiological standpoint, the nerves of the kidney have received repeated investigations, and the results yielded have added much to our knowledge of the function of the organ. On the other hand, no information concerning the histology of the renal nerves exists in medical literature, and it is our purpose in this paper to clear away a portion of the darkness in this field by one of the newer methods of nerve-staining—the chrome-osmium-silver method of Golgi.

The immediate source of innervation of the kidneys is the renal plexuses, derived in their turn from the solar plexus and lesser splanchnics; the plexus being composed, so far as the fibres are concerned, of threads from the semilunar ganglia, which in their turn receive fibres from the greater and lesser splanchnics and the right pneumogastric nerve. Therefore, it may be seen that the innervation of the kidney is directly dependent on the great sympathetic, and histologically speaking it is found to be true that all the nerves proper to the glands belong to the non-medullated type of fibre.

In the investigation, considerable difficulty was for a long time experienced in obtaining even moderately good staining of the fibres with the ordinary rapid silver stain, and it was only after the discovery of an ammonium compound that—by its chemical action in swelling the tissues and permitting a more rapid penetration by both the hardening and staining media,[1] without on the other hand destroying the relations of the various parts—sufficiently fine preparations were obtained to permit a study of the nerves distributed directly to the secretory portion of the organ—the convoluted tubules.

For the experimental research the dog—all full-grown animals—was first tried, but was later abandoned for the common mouse; the small size and comparative simplicity of the renal bodies greatly facilitating manipulation, it being found perfectly feasible to mount from eight to ten sections on each slide, thereby saving much time and trouble. In all, over 1500 sections were cut, mounted and examined, and from their collective view the results now given were obtained. Vertical sections were as a rule found to give much better pictures than longitudinal or transverse, hence the majority were made in that direction.

The nerves, after passing the hilum, may be roughly divided into two great divisions, the arterial plexuses proper, and the secondary divisions from them distributed to the tubules. At the point of entrance into the hilum a portion of the nerves undergo a deflection and are apportioned to the

[1] This method will be published in detail in another article.

submucous layers of the pelvis, forming an open-meshed network of fine interlacing fibrillæ.

Following the arteries, we see upon them, and in the perivascular sheaths, strands of nerve fibres ranging from two to a dozen in each bundle, some being fine, others coarse and broad. On the largest artery-trunks there is little division of fibres, but when the vessels begin to divide, so divide also the nerves with them, now branching and anastomosing freely, and developing here and there short branches that end upon the vessels in the form of minute bulbs, which are apparently in intimate connection with the cells of the smooth muscular fibres, though the transparency of the sections does not admit of certainty.

Nerve fibres accompany all arterial vessels, fine as well as large, to the remotest portion of the renal cortex; but at times deviations occur, fibres leaving the direction taken by the vessel penetrate in all directions between the uriniferous tubules, running on their sheaths or in the intervening connective tissue.

Following a branch from an artery on its way to a glomerulus, we see the nerve fibres accompanying it with the same general arrangement as upon the larger vessels; but the main stems are commonly of smaller calibre and less numerous, while the divisions are increased and the end-knobs more plentiful. At the commencement of the capsule of Bowman, the fibres usually branch, separating at an obtuse angle, then subdividing to some extent form an open meshwork in the tissues immediately surrounding the capsule. Where single glomeruli occur, the meshwork is of larger proportion than when they are multiple. Many of the nerves have the same short branches as are seen with the arterial plexus, and end in the same manner, in a rounded knob, often adjusted closely to the capsule of Bowman. At other times, however, this ending is off some distance in the tissues, or even against the membrana propia of a convoluted tube. All trace of other ending, upon the vascular coils of the glomeruli, or within the outer layer of the Bowman capsule, is not to be found even in the most perfect specimens obtainable. Quite often a nerve after forming a plexus around a capsule will throw off a single filament toward another glomerulus, irregularly coursing between the intervening tissue, there to form another network, though of smaller visible extent, perhaps again to undergo the same process.

Nerves also pass from the arterial plexuses to the extreme outer limit of the cortex, and apparently cross the intervening connective tissue into the capsule of the organ.

Nerve fibres in connection with a venous trunk have not been determined. At times they may be seen crossing at right angles, or even running longitudinally, but no offshoots are given to their walls, and the terminal bulb is invisible.

It is by no means uncommon in cortical areas to see the plexuses belonging to small arteries that have no visible connection with the vasa afferentia of the glomeruli, giving off numerous fibres that are distributed in great measure to the convoluted tubes, or diverging between the collecting tubes are soon lost. This arrangement differs considerably from that of the fibres accompanying the afferent vessels. So often does this occur that it would seem that there were two sets of nerve stems following arterioles, though this may not be borne out by further study.

Upon the vasa recta no nerves are stained.

Ganglionic enlargements of the nerve fibrillæ occur nearly everywhere in the kidney, but especially in the cortico-medullary zone they may be seen in the arterial plexuses, upon the tubuli, and particularly in the secondary networks that occupy the limits of the medullary and extreme cortical regions. Enlargement of fibres among the glomerular networks is on the other hand rare. No cell structure is visible in these ganglionic formations owing to the intensely black stain, and nerve cells, properly speaking, cannot be made out within the limits of the kidney. The ganglionic enlargements, from their number and frequency, must undoubtedly serve some important function in the economy of the organ, but what it is other than the reinforcement of the nerve fibres is obscure.

The research upon the second division, the fibres to the secretory portion of the organ, was attended with much greater difficulties than with the purely arterial ones, not so much owing to their fineness as to the difficulty of staining; and only after the addition of an ammonium salt to the ordinary Golgi staining media were we able to find them in any perfection.[1]

Here and there throughout the organ we find numerous nerves crossing in and between the complex picture of the interlacing collecting and convoluted tubules. Fibres having a closer relation than simply to enwrap the collecting tubes do not appear; they twist among them but give off no terminal filaments, but this makes it by no means certain that fibres distributed to the collecting tubules do not exist because they are not stained, and it may not be out of place here to advance the suggestion that it is perfectly possible that in the immediate vicinity of the more closely packed collecting tubes chemical conditions are present different from those in the more exclusively cortical areas, and that these conditions do not permit of the chrome-silver entering into its usual combination with the sympathetic fibres.

As seen above, fibres are distributed from the arterial plexuses upon the tubuli contorti. It is not easy from the course of the tubules to determine exactly how far on their course toward the loops of Henle the fibres are apportioned, but they have been met with nearly to the beginning of the loop; on the other hand they sharply disappear at the border of the Bowman capsule. The apparent number and divisions of the nerves on the tubules are very varied—a difference probably due to defects in staining. Frequent examples are met with that show on the tubules a few fibres, then others less common, in which the whole tubule is as it were enwrapped in a fine spray of fibrillæ.

Branching from an artery we may occasionally see four or five finer and coarser fibres, which upon reaching the tubule spread out considerably, yet occupy a somewhat central position on the membrana propia. Soon a number of them begin to anastomose, as well as give off branches; while further on, one

[1] During the course of this investigation an article on nerves of kidney, of two pages, by Retzius, appeared (Biol. Untersuch. Stockholm, 1892), but the conclusions are that nerves to the secretory portion of the kidney have no existence. The results with the larger vessels do not differ substantially from our own.

Erratum.

On page 141 of The Bulletin for December, 1892, column 2, line 58, read "7.7 to 11.3" instead of "9 to 13¼."

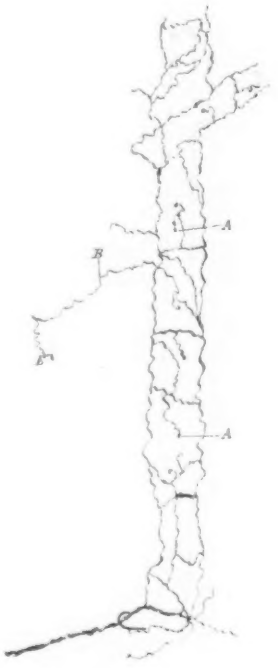

Fig 1.

Fig 2.

Fig 3.

Fig 6.

Fig 4.

Fig 5.

Fig 7.

D
E
E
E

or more of the outer fibres curve along toward the under side of the tubule; at the same time others change their course, passing either to other tubes, or are cut and lost. The central fibres and their anastomoses continue onward, finally ending in the usual rounded bulb-like arrangement on the membrane, but first acquiring a number of varicosities before so doing.

It is only with the ammonium-chrome-silver preparations that the finest details of the ultimate branchings of the nerves appear. Where in the Golgi sections only bulb-like endings of the nerves are to be found, with the other stain a vast multitude of the very finest ultimate fibrillæ are now seen. Non-anastomosing branches before invisible now come out distinctly, and run over the membrana propia for some short distance in an oblique direction, then vanish directly into the membrana; presumably into the cement substance between the epithelial cell lining, though this point is far from being positively asserted. Ganglionic bodies may also be seen developed among the fibres upon the renal tubules; they are not uniformly stained in the ammonium-chrome-silver preparations, but show a brown ground substance with here and there blackened granules, some finer, some coarser, but no appearance of a nuclear body.

On a few tubules, usually on a portion of a tube adjacent to a glomerulus, we have found a most intricate arrangement of small ganglionic bodies, often united to the vascular nerves by a single fibre. One of these collections contained seven distinct ganglia united by short processes thicker than the usual nerve fibre, and from this complex picture a number of short fibres arose, that were distributed upon the membrana in a direction toward the glomerulus, all invariably ending in the customary bulb.

The anastomoses of the renal nerves are somewhat unusual in character. A single fibre may occasionally be traced along its artery, and after separating from the main stem, followed into the remoter areas of the cortex. Soon after leaving the artery the fibre will be seen to split up, the branches anastomosing freely with each other and forming a very complex picture, one also of considerable area; but while the anastomoses of the branches among themselves are extremely frequent, they seem never to unite with rami from other nerves, and in this way a fibre may be traced all the distance from hilum to cortex, spreading over considerable territory, as well as forming a vast network, but it receives no additions from other intrinsic fibres unless in exceptional instances. Each fibre, therefore, forms to a certain extent a plexus-entity of its own. An exception to this rule occurs in the vascular plexuses, less certainly in the cortico-medullary and outer cortical networks, but holds good even for the small glomerular plexuses. Among the small nerves distributed on the convoluted tubes, anastomoses do occur and with frequency, but in this case it is difficult to ascertain if these particular nerves are originally derived from a single fibre, or from several.

CONCLUSIONS.

That the renal nerves enter with the vessels at the hilum, and that with their multifarious ramifications and ganglionic enlargements they form a not inconsiderable portion of the kidney's entire substance. From the vascular nerves—which we may call the primary ones—come secondary divisions, distributed throughout all the cortical and medullary-cortical regions in the form of a vast open network. That the glomeruli are surrounded by a wide-meshed plexus of fibres having terminal end-knobs approximated closely to the Bowman capsule, but that no finer nerves can be seen penetrating that membrane; and end-terminations within the capsule upon the convoluted vessels, either in the form of knobs, or in the finer pointed terminations cannot be discovered. That fibres pass off singly and separately from the vascular nerves, and are distributed on the convoluted tubes, not only with end-terminations in the form of the well-known globular ending, but also in fine delicate threads that penetrate the membrana propia of the tube and presumably enter the cement substance between the epithelial cells; and that the function of these divisions to the tubuli contorti is probably one concerning the urinary secretion. Lastly, that ganglionic enlargements occur widely, but that strictly speaking no nerve cells provided with nucleus, body, and protoplasmic arms, are to be found; and that all renal nerves belong to the sympathetic system.

EXPLANATION OF THE DRAWINGS.

Figure 1.—Medium-sized artery from near the hilum with its attendant nerve-plexus. *A*, *A*, terminal knobs; *B*, aberrant branch ending in terminal knobs.

Fig. 2.—Nerve-fibres surrounding a Bowman capsule, which is shown in outline. Some of the endings are closely adjusted to the membrane, others are more distant.

Fig. 3.—Ganglion formation from the medullary-cortical region of a dog's kidney. *A*, *A*, *A*, mark cut ganglionic bodies without visible connection with nerve-fibres.

Fig. 4.—Portion of a convoluted tube showing the distribution of medium-sized nerve-fibres upon it. The main stem is seen to end in a terminal bulb before the tube is cut. *A*, artery with blackened contents.

Fig. 5.—Outline of a glomerulus with the immediate portion of the collecting tubule. *A*, glomerular; *B*, convoluted portion. On the membrana propia of the tubule are shown a number of ganglionic bodies, from which arise fibres that are distributed on the membrana. All apparently end in terminal swellings. *C* marks the only fibre connecting with other nerves.

Fig. 6.—Ganglionic development on a portion of a convoluted tube with exceedingly fine branches that apparently pass through the membrana propia.

Fig. 7.—Exceedingly fine terminal fibres arising from nerve-stems on a convoluted tube. These fibres may be found on convoluted tubes as high as the commencement of the Bowman capsule, beyond which they disappear. They all seem to enter the membrane.

Fig. 8.—Outline of a portion of a mouse's kidney in vertical section, showing the expansion of a single fibre. *A*, capsule of the organ; *B*, papilla; *C*, artery entering the hilum; *D*, terminal bulb against the wall of a collecting tube; *E*, seven cut branches showing the nerve distribution to be much greater than is actually given.

Figs. 1 to 6 and 8 are from chrome-osmium-silver preparations, Nos. 6 and 7 are from ammonium-chrome-silver preparations. All are drawn with the aid of a Zeiss microscope, ocular 4, objective D.

November 10, 1892.

TUBERCULOSIS OF THE ŒSOPHAGUS.

(LARVÆ OF DIPTERA IN THE ULCERS.)

By Simon Flexner, M. D., *Associate in Pathology.*

[*From the Pathological Laboratory of the Johns Hopkins University and Hospital.*]

Among those organs which writers on tuberculosis have considered as relatively if not absolutely immune the œsophagus occupies a prominent place. Indeed, until recent years, well authenticated examples of tuberculosis of the œsophagus are not met with in the literature, so that Zenker, writing in V. Ziemssen's Handbook in 1876, still considers the question whether tuberculosis occurs in this organ an open one, and one searches the older pathological anatomies in vain for a reference to this subject. Rokitansky states in his pathological anatomy that tuberculous deposits are rarely, if ever, found in the œsophagus, and that they must not be confounded with the tubercular degeneration of the neighboring lymphatic glands. Hence, while this author does not entirely exclude the possibility of tuberculous processes beginning in the œsophagus, it must be inferred that he did not know of an undoubted case. It is only within the last ten years, since the articles of Weichselbaum and Beck appeared, that this affection has secured a place in the literature of tuberculosis, although a few isolated examples of the disease had been recorded before. Yet in the earlier cases, with a few exceptions, entirely satisfactory evidence of the tuberculous nature of the process in the œsophagus was not given, and Weichselbaum was therefore inclined to exclude all these from the list of tuberculous affections of the œsophagus. In this way he rejected the cases reported by Paulicki, Chovstek, Zenker and V. Ziemssen and Breus, the only ones with which he was acquainted save his own. Beck agreed with Weichselbaum in reference to all these excepting that of Breus, and referred to a case reported by Eppinger which escaped the attention of Weichselbaum, which he accepted as tuberculous. Yet both of these authors overlooked the case of Spillman published in 1878, and especially that of Frerichs, reported in 1882, in both of which the lesions doubtless were tuberculous in nature.

In considering the cases of tuberculosis of the œsophagus which have thus far been reported and in which the evidence of the tuberculous character of the affection is satisfactory, it is necessary to distinguish several classes. The first class will embrace those instances in which the tuberculous process arose through continuity or contiguity of structure, as, for example, where a caseous bronchial gland or group of caseous glands become united by inflammatory adhesion to the œsophagus and ulcerated into the latter, or in consequence of perforation of abscesses associated with caries of the vertebræ, and, finally, instances of tuberculous ulcers of the pharynx which, passing downwards, invaded the œsophagus.

Another group can be distinguished on account of the existence in the œsophageal mucous membrane of a previous lesion which is to be regarded as predisposing to the tuberculous infection. Such examples are afforded by the case of Breus and that of Eppinger.

Manifestly such instances as the preceding do not belong in the same category with cases in which the affection of the œsophagus occurred in the course of a general infection of the body with tubercle bacilli in acute disseminated miliary tuberculosis, or the infection of the mucous membrane with tuberculous sputum where no previous predisposing lesion was present.

It cannot be doubted that the œsophagus possesses a marked resistance to invasion with tubercle bacilli, applied either directly to its mucous membrane in cases of lung tuberculosis where the sputum is swallowed, or brought to it by the blood current in the general diffusion of the virus. But the opinion expressed by Eppinger that a previous lesion of the mucous membrane is essential to the development of the process cannot at this time be accepted, although we may be unable to say what the conditions are which determine the occurrence of tubercles at one time and not at another.

To the first class of cases belong those of Weichselbaum, Beck, Pitt, Penzoldt, Orth* and Zenker. Weichselbaum reports the case of a woman, aged 36, who had general tuberculous enlargement and caseation of the glands of the neck. The autopsy showed the cervical and mediastinal glands to be caseous; moderate lung tuberculosis, and intestinal tuberculosis. Moreover, four fingers' breadth above the bifurcation of the trachea the posterior wall of the trachea and the anterior wall of the œsophagus presented a perforated and sieve-like appearance. The perforations, which were of the size of a hemp-seed and eight in number, communicated with adjacent caseous lymphatic glands. The mucous membrane and submucous coat of the œsophagus above the perforations contained a few nodules varying in size from a hemp-seed to a pea; but below the perforations the nodules were more numerous. The smaller ones were gray in color, the larger yellow and caseous. The nodules stopped abruptly at the cardiac orifice of the stomach, and the pharynx was free from ulceration. There were, however, ulcers in the trachea and larynx. Histological examination of the ulcers in the œsophagus exhibited a base of granulation tissue on the surface of which necrotic and caseous material were present, and in the caseous material tubercle bacilli were found. The nodules were composed of lymphoid and epithelioid cells and showed, often, central caseation.

The first of Beck's cases occurred in a man of 45. The autopsy showed pyo-pneumo-thorax of the right side with great thickening of the pleura, and in the thickened pleura caseous masses were contained; tuberculous meningitis; in the left hemisphere of the cerebellum a caseous nodule the size of a

*Orth states that he has observed three cases, but he describes only two of these with sufficient minuteness to enable them to be classified.

nut; caseous area in the apex of the left lung; caseation of bronchial and mediastinal glands; large tuberculous ulcers in larynx; large tuberculous ulcer in posterior wall of trachea, miliary tubercles in trachea below the ulcer and in the right bronchus. The œsophagus contained in its anterior wall, opposite the bifurcation of the trachea, a diverticulum which appeared to be due to traction exercised by a packet of adherent caseous bronchial glands. At the line of junction of the middle and upper third of the œsophagus, on its anterior surface, there was a linear ulcer 3 cm. long by 1 cm. wide. Surrounding the ulcer, which had undermined the mucous membrane, there were fine nodules in the mucous membrane, some of which exhibited a superficial loss of substance. Between the anterior wall of the œsophagus and the posterior wall of the trachea, corresponding with the situation of the ulcer in the former, a spindle-shaped mass of five lymphatic glands was intimately adherent to the œsophagus, and the œsophageal ulcer corresponded with a softened area in the glands. Examination of the ulcer proved it to be tuberculous, and tubercle bacilli were demonstrated in it.

The second one was a laborer of 54, who, three months before his death, complained of difficulty in swallowing. At the autopsy he exhibited slaty induration of the lungs with caseation. In the pons Varolii there was a single caseous tubercle the size of a cherry seed; tuberculous ulcers were present in the larynx and on both sides of the epiglottis. The pharynx was the seat of extensive ulceration, the upper part alone showing a covering of epithelium. The pharyngo-laryngeal portion of the pharynx, the base of the tongue and the upper part of the œsophagus were included in a circular ulceration which was continuous with that described in the larynx and epiglottis. The ulceration in some places extended to the muscular coat; and corresponding with the upper part of the œsophagus, the tissues were dense and hard, owing to the cicatricial contraction, converting this portion into a narrow, rigid tube. Below the ulcer numerous miliary tubercles were to be seen, but they became less in number and finally disappeared as the middle of the œsophagus was approached. These small tubercles were covered with normal epithelium.

Pitt described a case in which adhesion had taken place between the œsophagus and bronchial glands resulting in perforation. Orth has seen two cases, perforation occurring in one in consequence of softened lymph glands, and ulceration in the other from the descent of a pharyngeal tuberculous ulcer.

Zenker saw two cases of extensive secondary perforation of the œsophagus produced by softening of caseous bronchial glands. In one case there was found, in addition, a severe phlegmonous inflammation of the œsophagus, extending the entire length of the tube, which he regards as certainly excited by the perforation. In the other case the mucous membrane around the perforation, for a distance of 3 cm., was thickly studded with small, round ulcers, extending only as far as the submucous tissue.

The three cases reported by Penzoldt comprise the most reliable literature in the remaining form of this class, namely, perforation of the œsophagus due to caries of the vertebræ. The first occurred in a man of 56, who, at the autopsy, was found to have lung and intestinal tuberculosis, and caries of the 5th and 6th cervical vertebræ. Opposite to the 5th vertebra the posterior wall of the œsophagus was perforated by direct extension of the abscess connected with the diseased vertebræ. In the second case there was caries of the first four dorsal vertebræ in a man of 46, and the œsophagus was perforated, the ulcer measuring 1 cm. in diameter. The finger introduced into the œsophagus could be passed into the cavity of the abscess. The third one relates to a man 53 years old. A partial autopsy only was permitted, and besides old lung tuberculosis, caries was present in the first four dorsal vertebræ. Opposite the first dorsal vertebra an opening 7 mm. in diameter existed in the œsophagus, which was continuous with a cavity in the vertebræ leading into the spinal canal. It must be stated that had histological examinations been made in these cases of Penzoldt, the evidence of the tuberculous nature of the processes would, to say the least, have been more conclusive.

To the second class belong the cases of Breus and Eppinger already alluded to. In the case reported by the former a tuberculous patient swallowed a caustic alkali for suicidal purposes and suffered stricture of the œsophagus in consequence. The autopsy revealed chronic tuberculosis of the lungs and lymph glands; tuberculous ulcers in the intestine; tubercles in the liver, spleen and kidneys. Moreover, there was great constriction of the œsophagus, and its inner surface presented numerous cicatrices and many irregular losses of substance. These ulcers showed in their bases and margins miliary and larger gray and caseous tubercles. There were scars and ulcers in the pharynx and in the stomach also. While no bacteriological examination was made, yet the histological examination showed the ulcers and nodules to be composed of lymphoid and giant cells.

Eppinger's case was a woman, age 45, who suffered from stricture of the œsophagus due to the thrush fungus. At the autopsy the fungus masses were carefully washed away, exhibiting the mucous membrane of the œsophagus covered with tuberculous ulcers varying in size from a pin's head to a pea. These were isolated or in groups. Lung tuberculosis with cavity formation was present and thrush occurred in the trachea. Eppinger states that tuberculosis of the œsophagus does not occur unless there has been a previous pathological change in the mucous membrane to enable the bacilli to enter the tissues. In this instance he believes that the Oïdium Saccharomyces albicans paved the way for the tuberculous infection.

When the foregoing cases are eliminated, the number of instances which remain in which the infection of the œsophagus may be regarded as occurring under the same conditions as, for example, intestinal tuberculosis, is not large and entirely warrants the conclusion that this structure is relatively, although not absolutely, immune to tuberculous disease. The following instances comprise the third class:

Spillman's case occurred in a man of 51 who had suffered from stricture of the œsophagus, the autopsy revealing an ulcer 1×1.5 cm. occupying the middle part of the œsophagus; in the center of which a small, hardly-perceptible perforation communicating with the left bronchus was present. There was pleural tuberculosis. The bronchial glands were swollen and pigmented.

Frerichs studied 30 cases of acute and 250 cases of chronic tuberculosis. In the first series, eight cases had tuberculosis of the pharynx, tonsils or tongue, but in no instance was there œsophageal tuberculosis. Of the chronic cases he found œsophageal tuberculosis in only one case. This was in a child eight years of age who had caseous foci in the lungs, tuberculous ulcers in the pharynx and intestines, and caseous masses in the kidneys. In the lower third of the œsophagus there were several exquisite tuberculous ulcers. The edges of the ulcers were sharp, while the bases had a grayish-yellow appearance and contained caseous detritus. Distinct tubercle nodules were visible in the periphery of the ulcers seated in the intact mucous membrane.

Mazzotti reports three cases belonging to this group. The first in a child of 10 years who died of acute miliary tuberculosis, following tuberculosis of the bronchial glands, in the course of which an eruption of miliary tubercles had taken place in the œsophagus. The second in a man of 39 with cavities in the lungs. Tubercles were present in the depth of the mucous membrane in the upper part of the œsophagus, while lower down ulceration had occurred. The last one was a woman, aged 37, who had lung tuberculosis with cavity formation and intestinal tuberculosis. In the anterior wall of the œsophagus, opposite the larynx, a prominent ring-like elevation the size of a penny was found. This was white in color, opaque and ulcerated. Below the ulcer, 10 or 12 granular elevations no larger than pin-points were seen. In all these cases tubercle bacilli were demonstrated. In none of Mazzotti's cases did the number of ulcers exceed six, and they lay in the lower part of the tube and conformed to its long axis.

To this last class of cases we are enabled to add one. There has been only one reported up to the present time in which a tuberculous ulcer beginning in the œsophagus perforated this tube. We refer to the case of Spillman. In the instance which we observed the perforation took place into the left pleural cavity; and, although it may be anticipating our report, it may be stated here that the tuberculous pleurisy is to be attributed not to an infection of the pleura following this perforation, but to the lung tuberculosis with which it was associated.

*A woman, A. K., white, aged 33, was admitted on August 3d, 1892, into the medical wards, service of Dr. Osler, of the Johns Hopkins Hospital. When admitted, she complained of cough, fever and shortness of breath. She gave a tuberculous family history, but personally she had always been strong up to Christmas, 1891. Early in 1892, as she stated, she had two attacks of influenza, from which time she dates her present illness. This latter began with cough, which continued from this time on, and in May, 1892, she experienced a sudden and severe pain in the left side. At the St. Joseph's Hospital, whither she went and remained seven weeks, her chest was aspirated once.

Status præsens. Emaciated, pale; pulse 92 to the minute, compressible, regular in force and rhythm. The left side of the chest bulges and the intercostal spaces are obliterated. The cardiac pulsation is observed in the 2d, 3d and 4th spaces on the right side. Percussion note on the right side clear, except over area of cardiac dulness. On the left side the front note is feeble and tympanitic. The pulmonary resonance ends at lower border of 6th rib in the mammary line on right side; flatness begins on left in line following 6th rib into axilla. In erect posture, on the left side, flatness extends as high as the 3d rib, and posteriorly there is flatness at a point 3 cm. above the angle of the scapula. On this side, behind, there is a fluctuating area 7 cm. in diameter opposite the 8th and 9th spaces, which pulsates with the respirations. Respirations on right side clear; on left enfeebled, and, passing into the flat area, they become distant and tubular. Vocal fremitus absent over the flat area. Over front of left lung, in recumbent position, although respiration is not typically amphoric, there is distinct metallic tinkling; succussion marked. Other viscera negative. Sputum contains tubercle bacilli. The patient was transferred on August 6th, 1892, to the surgical ward for operation.

She was operated upon by Dr. Finney, on the 6th of June, under ether narcosis, and five cm. of the 6th rib excised. Pus did not begin to flow immediately, as the pleural cavity contained air; and the odor emitted was very offensive. Turning the patient on the side, a moderate quantity of dirty grayish pus escaped. While coming from under the ether the patient vomited, and the material ejected had much the appearance of the contents of the pleural cavity. The patient did well after the operation, and on the 10th the following note was made: "The pleural cavity is irrigated daily with normal salt solution, and the washings contain coagulated milk and have a strong odor of whisky, these having been administered by the mouth." On August 18th another note to this effect was made: "Irrigation continued. The patient is now allowed light diet. Small masses of food ingested appear in the washings from the pleural cavity. The wound gapes widely, the diaphragm can be seen moving up and down and the pulsation of the heart can be watched, and by introducing the finger through the wound, felt. Patient is very weak and emaciated; there is marked but not very severe dyspnœa." August 23d, at 4 P. M., she died.

Autopsy, August 24th, at 8.30 A. M. Anatomical diagnosis: Tuberculosis of lungs, lymph glands of neck and bronchial glands; tuberculous pleurisy; pyo-pneumo-thorax; gangrene of pleura; perforating tuberculous ulcer of œsophagus; intestinal tuberculosis (recent). In reporting the autopsy only such parts of it will be given as bear on the present paper.

Thorax. In the left pleural cavity are 500 cc. of a turbid, foul-smelling fluid in which float flakes and coagula mostly white in color; and thick, yellow, sticky pus adheres in places to the walls of the cavity. Both leaves of the pleura are thickened, dark in color and gangrenous in appearance. Small hemorrhagic spots are scattered over the surfaces of the pleura. The lung is much reduced in volume, deeply pigmented and very dense. 3.5 cm. from the posterior border and about midway of the compressed lung is a small opening in the pleura through which a probe can be passed into the lung substance. On section this orifice is seen to lead into a small cavity, the walls of which are composed of a grayish-white, granular,

*The clinical history is taken from the medical and surgical records of the Hospital, by the kind consent of Drs. Osler and Finney.

caseous-looking material. The lung is airless, dense, deeply pigmented, and in the lower lobe a number of dilated bronchi filled with thick, purulent material occur. Right lung: free from adhesions; pleura generally delicate. The surface of the lung is moderately pigmented and to the touch has an irregular feel. There are several circumscribed deposits of granular fibrin in the pleura over the lung. On section the consistence of the tissue is increased; the cut surface presents an irregular mottled red and gray color, with other areas deeper red in color, due either to great congestion or hemorrhage. The irregularity of the surface is due to lobular areas of consolidation of the lung substance corresponding with the fresh fibrinous deposits on the surface. In the apex of the lung is a small tuberculous cavity with thick caseous walls which communicates freely with a bronchus.

Œsophagus. For a distance of 4.5 cm. the œsophagus lies freely exposed in the left pleural cavity. At a point 2.5 cm. above the arch of the aorta where the left common carotid is given off, there is a perforation leading directly into the lumen of the œsophagus. The tissues surrounding the œsophagus are œdematous and hyperæmic, and a considerable loss of substance has occurred in the connective tissue covering it. For a space of 4×2 cm. the connective tissue sheath is entirely wanting or very thin. On section of the œsophagus there are, in the anterior wall, but somewhat to the left of the middle line, two ulcers about equal in size and measuring 7.5 by 4 mm. The more superficial one reaches the muscular coat but does not penetrate beyond, while the other has perforated the œsophagus and communicates by a small opening with the left pleural cavity. The edges and bases of the ulcers are smooth. In the ulcers are several maggots, still living. Species not determined.

Lymphatic Glands. All the glands of the neck enlarged, adherent to one another and caseous. Bronchial glands caseous.

Larynx and Pharynx are free from ulceration.

Stomach and Intestines. The former is free from tuberculosis, while in the intestine, situated in the patches of Peyer just above the valve, there are several small circumscribed caseous nodules free from ulceration.

Histological Examination of the Ulcers in the Œsophagus. The Non-Perforating Ulcer.—The base of this reaches the muscular coat in its central portion and at the edges it gradually merges into the surface of the mucous membrane. The pavement epithelial covering of the mucous membrane can be traced to a point beyond which the infiltration of the tissue extends in the underlying structures. The ulcer has undermined the mucous membrane in this way by the infiltration of the submucous coat, and this has occurred on one side to a greater extent than on the other. About one half of the ulcer is covered by a projecting mass of mucous membrane and submucosa, this overlying mass being covered on its under side by a growth of epithelium which runs along the base of the ulcer for two-thirds of its extent, and is continuous with the surface growth. Some of the mucous glands in the projecting piece of mucous membrane are dilated and filled with cast-off cells and cell detritus. From the fact that the cells are sometimes several layers in thickness in these glands there has doubtless been an active proliferation of epithelium. The veins are dilated, filled with blood, and thick masses of round cells surround them. The arteries show a thickening of their internal coat.

Definite tubercles occur in the base of the ulcer and in the projecting mass of mucous membrane. They are present both in the mucous membrane and in the submucosa, and are composed of epithelioid and lymphoid cells with occasional giant cells. The infiltration, as before stated, extends into the tissues, particularly the submucosa, beyond the ulcer. The tubercles are not caseous, but present evidences of cell necrosis in the presence of fragmentation of nuclei; and leucocytes have been attracted to such areas. Just beneath the new growth of epithelium in the base of the ulcer there are many round, lymphoid cells, and no tubercles.

The muscular coat of the œsophagus in this situation consists of smooth and striped fibers. Tubercles occur in the smooth muscle. The striped fibers often present a swollen, contorted and hyaline aspect, and the nuclei of the sarcolemma are often absent.

The Perforating Ulcer. — The tuberculous process at the edge of the ulcer is found especially in the submucous coat, and it extends below into the muscular coat. Some of the tubercles are quite large, and they are composed principally of epithelioid cells, with an occasional giant cell. The follicles exhibit here also a proliferation and desquamation of cells associated with degeneration of the cast-off ones; and into such follicles leucocytes in considerable numbers have wandered. There has been a partial, but comparatively slight, growth of epithelium along the edge of the ulcer. The muscle in the edges of the ulcer is mostly necrotic and fails to stain, and some fibers present the hyaline metamorphosis.

Tubercle bacilli, although few in number, were found by means of Ziehl's carbol-fuchsin staining method in the tubercles.

Besides the cases given above which represent the most reliable examples of tuberculosis of the œsophagus met with in the literature, there are a number that have been alluded to as doubtful. The most of these have been considered by Weichselbaum, Beck and Zenker and V. Ziemssen, and by common consent rejected. Such are the cases reported by Chovstek, Paulicki and Kraus, and, moreover, two cases which came under Zenker's observation, concerning the interpretation of which he does not commit himself. Finally, those of Uhde and Loeschner, quoted by Penzoldt as tuberculous in character, would seem to belong with the doubtful ones.

However, in examining the cases of Chovstek and Paulicki we think it exceedingly probable that they are examples of tuberculosis. We do not, however, class them with the accepted cases, as no histological examination was made in either instance.

Chovstek's report refers to a man of 43, who eight days before his death began to suffer from difficulty in swallowing. The section, made by Weisbach, revealed tuberculosis of the lungs, and, besides, in the œsophagus, at the level of the 3d dorsal vertebra, numerous losses of substance, some of which were round and others long or irregular in shape. The edges of the ulcers were sharp, but undermined, the bases in part

smooth and again irregular. In the base of the ulcers yellowish-white specks were imbedded.

The case of Paulicki occurred in a man of 74 who had tuberculosis of the lungs, larynx and intestines. Three months before his death symptoms of stricture of the œsophagus developed, and at the autopsy a constriction was found at the level of the cricoid cartilage, corresponding with which there was an ulceration of the posterior wall of the œsophagus. The ulcers (two in number) did not reach to the muscular coat, and did not present a caseous appearance. The epiglottis was ulcerated, and characteristic girdle ulcers existed in the intestine.

Again, two of the cases observed by Zenker, and considered as doubtful by him, would appear to belong to our first class and have been given there. The remaining one is stated by him to have occurred in a child. There was a single, round ulcer in the œsophagus, and adjoining this ulcer fine, punctiform nodules were discerned in the mucous membrane. The examination was not conclusive of tuberculosis.

The rarity of this affection and its insidious character probably account for the fact that there is little reference to it in text-books on medicine. It has no definite symptomatology, and the suggestion of Mazzotti that it may be attended with pain, difficulty of swallowing and stricture, while evidently correct, is not distinctive. Penzoldt, however, was able to diagnosticate during life the third case reported by him, although not until perforation had occurred and the contents of the abscess had been evacuated with the sputum. Hence it may not be out of place to venture the suggestion that great pain on swallowing, or stricture of the œsophagus, developed during the course of chronic lung and lymph gland tuberculosis or caries of the vertebræ, should be considered with reference to the possible implication of the œsophagus in the tuberculous process.

LITERATURE.

Beck: Prager med. Wochenschrift, 1884, No. 35, p. 341.
Breus: Wiener med. Wochenschrift, 1878.
Chovstek: Oesterreichische Zeitschrift f. praktische Heilkunde, 1868.
Eppinger: Prager med. Wochenschrift, 1881, Nos. 51 and 52.
Frerichs: Beiträge zur Lehre von der Tuberkulose, 1882.
Kraus: Allgemeine Wiener med. Zeitung, 1869, No. 19.
Loeschner: Aus dem Franz-Josephs Kinder-Spitale, Prag, 1868.
Mazzotti: Revista Clinica, Januar, 1885.
Orth: Lehrbuch d. speciellen pathologischen Anatomie, Bd. 1, p. 681.
Paulicki: Virchow's Archives, Bd. 44, 1868, p. 373.
Penzoldt: Virchow's Archives, Bd. 86, 1881, p. 448.
Pitt: Pathological Transactions, London, Vol. xxxix, p. 107.
Rokitansky: A Manual of Pathological Anatomy, Sydenham Soc. Trans., Vol. ii, p. 11.
Spillman: De la tuberculisation du tube digestiv. Paris, Thèse, 1878, p. 97.
Uhde: Deutsche Klinik, 1856, No. 3, p. 33.
Weichselbaum: Wiener med. Wochenschrift, 1884.
Zenker: V. Ziemssen's Handbook, American edition, Vol. viii, pp. 116 and 190.

TRANSPOSITION OF VISCERA.

BY THEODORE HOUGH.

In the course of some physiological experiments at the Biological Laboratory of the University, there came under my notice the following case which presents a peculiarity, interesting enough, although by no means unknown to anatomists. Upon opening the thorax of a dog it was found that there was complete transposition of the blood-vessels of that cavity, the aorta being on the right side of the mediastinum and the great veins on the left. The arch of the aorta gave rise first to the brachiocephalic artery, from which came off the two carotids and the *left* subclavian; the second branch of the aorta was the *right* subclavian. The azygos vein was on the left side of the body, as were also the two *cavæ*.

Subsequent dissection showed that not only were the thoracic blood-vessels transposed, but that there was similar transposition of all the viscera of the thoracic and abdominal cavities; indeed, it has always been found that where the aorta arches over the root of the right lung and continues on the right side of the body, all the viscera are transposed. The stomach was on the right side, its cardiac end being to the left, and its pyloric end to the right. The concave side of the loop of the duodenum, containing the pancreas, was turned toward the right; the liver also was on the left side, with its lobes exactly reversed. The left kidney had a more anterior position than the right one. The anatomy of the heart, so far as the shape of its cavities, thickness of its walls, position and number of its valves, and connection with the greater and lesser circulations are concerned, showed the same perfect transposition, as did also the anatomy of the lungs, the right lung having two lobes and the left four. In short, the viscera and blood-vessels of a normal dog bear the same relation to those of the dog I am describing as they would to their image in a mirror.

It is conceivable that the change from the embryonic condition, where all the viscera are either median or bilaterally symmetrical, to the adult condition, where lack of bilateral symmetry is so marked, may be the result of some mechanical strains caused by the position of the embryo. We may suppose such influences to cause the growth of a primitively median organ, such as the liver or the stomach, to one side or the other, and that this asymmetrical position of one organ can influence the others so as to cause them likewise to become asymmetrical. But when we consider the fact that this transposition affects every organ in the pleuro-peritoneal cavity, and that it is so complete, it must be admitted that it is more probable that the cause must be looked for in the egg itself, which was in the first place a "right-handed" and not a "left-handed" one; that is to say, the characters of the egg were such that the position of the adult organs was transposed, apart from any mere mechanical influence of position, etc.

PROCEEDINGS OF SOCIETIES.

THE JOHNS HOPKINS HOSPITAL MEDICAL SOCIETY.

Meeting of November 7, 1892—(continued).

Preliminary Report on Aspergillus Mycosis of the Antrum Maxillare.—Dr. MACKENZIE.

I had hoped to give at least a complete clinical picture of the disease upon which I am to speak to-night, and to that end made an engagement with the patient whose case serves as the text for my remarks and from whom the specimens have been taken, to come to town to-day, but I presume the threatening weather has prevented her from coming. It will serve my present purpose to direct attention to the more salient points in the case. In 1883 she consulted Dr. Theobald on account of a pain in the right ear, which he said was as well marked a case of pure otalgia as one often sees. This, according to the note which he has kindly written me, was the usual symptom that would bring her to see him from time to time. Often there was nothing wrong to be seen in the ear, but at other times there would be some swelling of the outer third of the meatus, and tenderness on pressure. March 4, 1889, a threatening furuncle appeared in the auditory canal; in October, 1887, an abscess of the lobe of the ear, which was opened by Dr. Theobald. There never was at any time aspergillus in the ear, nor even a condition which would suggest the probability of its presence Dr. Theobald first noticed a swelling on the right side of the face, January 7, 1889, and a week later recognized the presence of a disease of the antrum, she having had a discharge of pus from the nose, with relief of pain and diminution of swelling of the cheek in the meantime. February 27, 1891, he noted some swelling over the root of the nose, with pain over the right eye, and he feared that there was trouble beginning in the frontal sinuses. These symptoms disappeared later. Dr. Theobald was disposed to think that the disease in the antrum had something to do with the ear symptom, and perhaps was the chief cause of the otalgia which she had from time to time.

About two years ago her dentist brought her to Baltimore in consultation with Dr. James H. Harris, and from the history which Dr. Harris got of her antral trouble he seemed to think that the trouble was due in the first instance to caries of the molar tooth, possibly originating as a variety of periodontal inflammation, with subsequent antral trouble. The antrum was opened at that time (the second molar tooth was extracted and the floor perforated by a large drill) and an immense amount of pus washed out with a syringe. She was seen subsequently by several general surgeons who insisted upon scraping out the antrum. She was a little afraid of the operation and declined it. So things have been going on for the past two years, the antrum being syringed out daily with various alterative, astringent and antiseptic solutions. The only drug which seemed to give her any relief at all was nitrate of silver in strong solution. This would stop the discharge for a week or two and then it would become as bad as ever. About two months ago a new feature appeared in the case which gives it its present peculiar interest. At that time she began to pass through the opening made into the antrum from the mouth, shreds of false membrane which varied very much in length, some being as long as the index-finger. These passed off at intervals of a few days to a week or ten days. This process went on in spite of nitrate of silver and strong applications to the interior of the antrum, and finally the case was seen by me in consultation with Dr. Harris and at once commanded my very great interest. The chief point of interest was the passage of a false membrane from the antrum. We are taught that the antral mucous membrane is incapable of producing a false membrane.

Zuckerkandl, who of recent German authors has most carefully studied the normal and pathological anatomy of the antrum, lays it down as a dictum that owing to the anatomical structure of the antral mucous membrane, the presence of a diphtheritic or other membrane is utterly impossible. Knowing this, of course the case possessed an extraordinary interest for me. I obtained some of the membrane and sent it to Dr. Flexner, who has very kindly and very skilfully prepared some very exquisite sections, which you will see under the microscope. It consists of three layers. The first layer consists of a mass of round cells with some loose epithelium of the mucous membrane of the sinus. The second layer is apparently one of pure necrosis, which does not stain. Upon this layer rests a mass of the so-called aspergilli. The variety of the aspergillus has not been determined. Dr. Flexner rather inclines to the belief that it is the aspergillus fumigatus. The aspergillus sends its spores in two directions, off from the free surface and down into the deep layers. It is a beautiful and interesting sight.

The subject of aspergillus infection is receiving some attention at the present day. Apparently very little is known about it. There seem to be three varieties that create most devastation,—the niger, the flavus, and the fumigatus. From what I have read on the subject, more trouble follows in the wake of the fumigatus than in that of either of its brethren, the flavus or niger. The aspergillus niger is familiar to us all as the parasite that infests the auditory canal, and also the eye, where it is found on the cornea. I have not gone sufficiently deeply into the literature of the subject to warrant saying that this is the first case of aspergillus infection ever discovered in the antrum, but I have never read of such a case, and I can state from a tolerably fair familiarity with the literature that very little is known about it, if such a case has ever even been reported. It is quite familiar as a disease of some birds, such as the dove and various other smaller birds. In them the aspergillus fumigatus is found in the air-passages, and according to some writers it produces a pneumonia with necrosis of the lung tissue. The aspergillus that does this harm is generally the fumigatus. I think experiment has shown that the aspergillus niger is far less infectious than either the flavus or fumigatus.

The presence of this necrosis and the great depredation that this parasite seems to have done in the false membrane would rather incline me to believe with Dr. Flexner that it is the aspergillus fumigatus and not the ordinary niger found in the ear and on the cornea. It is said that aspergillus pneumonia occurs in a sort of epidemic form in zoological gardens. We have this on the authority of Flügge. Of course it is a matter of very great interest as to the mode of infection in this case. This will have to be determined by future study of the clinical history. My principal object in writing to Dr. Theobald was to know if there might not be some roundabout mode of infection from the ear. These aspergilli seem to flourish best on moist soil, and on mucous membranes where the epithelium has become moistened and loosened. I cannot, of course, say that any of the injections had anything to do with the production of this parasite. It is said that substances containing oil or any easily decomposed fatty matter are powerful in producing them. A singular fact in connection with the development of aspergilli is that, according to the united testimony of all observers, they are not developed during active suppuration. As far as I can understand from the history of this case, there has been quite active suppuration right along. The aspergillus may have developed for the first time last August, or it may have lain dormant in the antrum for a long time. According to the natural history of these parasites, they may remain on the membrane for a considerable length of time before evidence of their existence is forthcoming.

In our country we rarely see parasites in the nasal passages or in the accessory cavities. In India they are quite common,—maggots and one thing or other. People who live in dirt and filth are apt to have them, and amongst our own negroes in the South the bluebottle fly is a frequent visitor to the sad nostrils of the young African as he basks in the sun; they deposit their ova there, and

these finding a fertile soil grow up into full-fledged maggots. The older writers report cases, some of them possibly authentic, of all sorts of insects in the frontal sinuses, antrum and all of the accessory passages of the nose, especially in the frontal sinus. Sir William Hamilton, years ago, wrote a most interesting paper on parasites in the frontal sinuses, in controverting the then prevalent doctrine of phrenology. He goes into the literature of the low forms of life that infest the frontal sinuses, to show that the sinuses are capable of indefinite extension and therefore that the organs which the phrenologists locate back of the sinuses were mythical. According to him, the leech, the lumbricoid and various other forms of low life find in these vast antra either a birthplace or an asylum. I thought it interesting to bring this subject up for discussion to-night. If not the first time the aspergillus has been found in the antrum, the case is at least a *rara avis*. I shall prepare a more elaborate paper upon the subject for the Hospital Reports.

Dr. Theobald.—There is not much that I can add except to confirm what Dr. Mackenzie has said as to there never having been aspergillus in the ear. It was rather an obscure case in that the pain in the ear was, without evident cause, so severe and so persistent. It is rare that we meet with a pure otalgia. In most cases of so-called ear-ache it is very evident when we glance into the ear why there should be pain. I am inclined to think, in the light of the more recent developments in this case, that the trouble in the antrum may have been brewing for a long time and was, perhaps, the cause of a good deal of severe pain in the ear. It is well known that in some instances we have pain in the ear due entirely to reflex dental irritation. I recall a case in a small child with no symptom but pain in the ear. I directed my attention to that organ. Subsequently an abscess made its appearance at the root of one of the lower incisor teeth, and when the tooth was removed the pain disappeared from the ear. The whole trouble was a reflex neuralgia. This explanation of the pain in the ear is, I think, a reasonable one in the case reported,—that through the branches of the fifth nerve the severe pain may have been caused by the irritation in the antrum. At times there was simply this otalgia; at other times, however, there was evidence of inflammation in the cartilaginous portion of the auditory meatus. I cannot see that the inflammation in the auditory canal could have been connected with the trouble in the antrum, but the otalgia, it seems to me, might have been.

Dr. Flexner.—Dr. Mackenzie brought us in alcohol a piece of tissue having the appearance of a coiled-up false membrane. The thickness of the separate layers did not exceed 3–4 mm. and the membrane was found to be very friable. Sections made of the membrane which had been imbedded in celloidin, showed on microscopical examination several layers. The undermost layer, corresponding with its attachment to the mucous membrane of the antrum, was composed of a layer of polynuclear leucocytes. This varied in thickness in different parts and formed about one-third of the entire thickness of the false membrane. A few cells of a different type, larger, with more protoplasm and vesicular nuclei, being sometimes flat and scale-like and again narrow, elongated and columnar, were present in the layer of leucocytic aggregation. They were oftenest in the lower part of the membrane nearest the points of attachment to the mucous membrane of the antrum. These epithelial cells presented evidences of degeneration in the staining properties of the protoplasm as well as in the shriveled appearance and diffuse staining of the nuclei. Above the layer of leucocytes an indefinite substance was found, composed of granules and fibre-like processes which stained poorly in hæmatoxylin and eosine. But in the specimens stained in Weigert's fibrin-stain this layer was seen to be felted and composed in large part of mycelia of a fungus. The uppermost layer of the membrane is composed of branches from the mycelia below, bearing on their summits the fruit-bearing heads. The fungus was recognized as belonging to the aspergilli, and Dr. Lotsy, who kindly examined the specimen, informs me that it is the aspergillus fumigatus. The fruit-bearing heads were found only on the summit of the membrane in its most superficial parts, but in sections stained as before mentioned with Weigert's fibrin-stain the mycelia were especially well shown, and these could be traced at intervals below into the deepest part of the membrane. No fibrin was made out in the membrane.

A Case of Tuberculous Pericarditis from Dr. Osler's Wards. —Dr. F. R. Smith.

E. B., aged 39, washerwoman, colored, admitted to ward G of the Johns Hopkins Hospital, July 18, 1892, complaining of pain and swelling in the abdomen, swelling of the feet, and cough.

So far as could be gathered, the family history is good. She has two brothers and four sisters living and well.

The patient has had two children and one miscarriage. Has had uterine trouble at times, but has been quite regular until two months ago. Since childhood, during which she had the ordinary infectious diseases, she has enjoyed very good health.

Her present illness began early in May, when she had shortness of breath, nausea, loss of appetite, and pain in the abdomen. The symptoms which she narrates are indefinite, and she also speaks of headache and attacks of diarrhœa. The main points gathered are that she has during the past three months been in bad health, has lost in weight, has had difficulty in digestion, and shortness of breath. About a month before admission she noticed some swelling in the abdomen, and about the same time the face became puffy. The feet began to swell four days ago. She has sometimes had attacks of coughing at night, but no expectoration. On admission, the note made by Dr. Thayer was as follows: "Rather sparely nourished woman, dorsal decubitus, lips and mucous membranes somewhat pale; tongue slightly coated; respirations 30 per minute; pulse 104, regular in force and rhythm, tension not increased; temperature on admission 98.2°.

Expansion equal on both sides of the thorax. Percussion everywhere clear. On auscultation the only abnormal signs are fine moist rales at both apices during inspiration.

Heart. There is slight heaving in the cardiac area; the point of maximum impulse is hard to determine. The area of cardiac dullness begins about the second rib and extends far to the right of the sternum. Flatness begins at the third. The general outline of the area as indicated is triangular, and it extends to the left, far down into the seventh interspace. This flatness in the cardiac area is distinctly movable.

On auscultation the sounds are feeble at the apex, become louder in the fourth and fifth interspaces, and are still more distinct at the base, where the second aortic sound is accentuated.

Abdomen. The abdomen is full, generally tympanitic, and the walls are a little tense. The liver flatness begins at the seventh rib in the nipple line, and extends five fingers' breadth below the costal margin. The edge is not distinctly palpable. The spleen is not palpable.

There is now no swelling of the legs, but she states that they were swollen four days ago."

The urine was cloudy, acid, sp. gr 1012, slight trace of albumen, no sugar, numerous leucocytes.

During the first ten days in hospital the patient improved. The temperature chart shows a great irregularity, the morning register was at 98° or 98.5°, rising in the afternoon between four and six o'clock to 101°, sometimes to 102°. An ice-bag was placed over the heart and she was given stimulants. For the second ten days, from July 29th to August 8th, there was distinct improvement, the temperature was lower and only once reached 102°. On August 1st it was noted that the area of dullness was diminished, and there was a friction rub heard in the mid-sternal line, synchronous, however, with the respiratory, not with the cardiac movements. On the third day it was noted that there was a well-marked rubbing friction heard in the second and third left interspaces, being heard

also as far out as the nipple line, and over the sternum adjacent to these spaces. The pulse has been very variable, ranging from 98 to 112. The patient is brighter and seems to be improving.

Between August 8th and 20th the irregular fever persisted and on several occasions rose in the afternoon to 103°. She complained at times of pain in the præcordial region and of general abdominal pain. The pulse has ranged from 100 to 125. The note on the 17th was as follows:—"There is moderate heaving over the lower sternum and the epigastrium; the point of maximum impulse is rather difficult to determine. Relative dullness begins at the second rib and extends well to the right of the sternum. The absolute flatness, however, scarcely exceeds the normal limits. The heart sounds heard at the outer limit of the dullness are very feeble, and the first is followed by a short systolic puff. Passing inwards, the murmur becomes louder, but disappears above the fourth rib. In the lower sternum there is a well-marked double friction murmur, soft, close to the ear, and resembling in this respect a pericardial murmur. The murmurs are more intense on forced inspiration."

From September 1st Dr. Osler saw the patient daily.

Sept. 11th. The note to-day was as follows: "The intermittent type of fever has persisted, the temperature in the evening rising to 102.5°, and occasionally, as on September 6th, to above 103.5°. The pulse has been more rapid, frequently over 120. There has been a good deal of tenderness over the fourth and fifth costal cartilages on the right side.

On percussion the flatness does not begin until the fourth rib, but extends beyond the right border of the sternum. The sounds at the apex are feeble, and there is heard here a slight præcordial friction murmur which becomes more distinct towards the ensiform cartilage. No endocardial murmurs heard. Of late, the cough of which the patient complained on admission has become more troublesome, but there is no expectoration. The percussion note at the left base is somewhat higher than at the right, and the breathing is feebler and towards the axilla somewhat tubular in character. There are numerous rales at both bases. The abdomen is a little full and she complains of pain in it."

On the 13th a small quantity of mucopurulent sputum was obtained which did not contain tubercle bacilli. During all this time, although the fever has persisted, she has, curiously enough, steadily gained in weight; thus on August 8th she weighed 104 pounds; on the 16th the same; on the 29th 109 pounds; on September 5th 110, and on September 13th 114 pounds.

September 22d. The abdomen has become more swollen. On examination there is distinctly movable dullness, though fluctuation cannot be readily obtained. There is tenderness at the region of the liver, but no nodular masses can be felt. The friction murmur up and down the sternum is more marked, and there is also heard on inspiration a creaking, leathery friction murmur. The physical signs in the lungs show an increase in the rales which are heard all over the whole of the right back. The tactile fremitus is a little increased and resonance is defective at the right base. There is no pleural friction rub.

On the 25th it was noted particularly that the pitch of the percussion note towards the outer side between the left scapula and the axilla was higher, but without any trace of tympanitic quality. The pericardial murmurs are loud. During the past week the patient has been worse. There is more pain in the epigastric region, the cough is very worrying at night, and there is increasing œdema of the legs and the skin of the back.

At her own desire the patient was taken to her home on September 27th.

Up to September 1st the patient had been under the care of Dr. Thayer, and the case was regarded as one of pericarditis with effusion, and when he left for his vacation she seemed to be improving.

During the time she was under Dr. Osler's care he made her the subject of several very careful examinations, and repeatedly demonstrated the condition to the class of graduate students, and discussed frequently the probable nature of the case. In a note he says: "The persistence of the fever and the marked involvement of the lungs suggested to my mind the possibility of the existence of tuberculosis. We could not, however, for some time obtain any sputa for examination, but after September 1st on several occasions she brought up a mucopurulent, and once an almost purulent expectoration, which was very thoroughly examined with negative results. Notwithstanding this, it seemed to me that the case was unlike any ordinary rheumatic or septic pericarditis, and I felt justified in dictating the last morning I saw her that 'the protracted course of the illness, the signs of pulmonary trouble, and swelling of the abdomen make it probable that the patient has tuberculosis.'" Three days after her return home she died, and we were fortunate enough to secure an examination, which was kindly made by Dr. Flexner. The following is an abstract of his report.

Autopsy. There was a considerable quantity of clear serum in the peritoneum, both layers of which were smooth. There were no pleural adhesions, no tubercles on either layer. The pericardial space uncovered by lung, unusually large, measured 15 by 20 cm. The parietal pericardium was almost everywhere free. The outer surface showed numerous white elevations, many of which were confluent and more massed in some places than in others. On incision the layer is greatly thickened, in places measuring as much as 6 mm. About 300 cc. of turbid serum escaped. The visceral layer was everywhere covered with flaky yellowish white fibrin. On section this layer was found to be greatly thickened and contained numerous yellowish, caseous masses; thus the thickness of the wall of the left ventricle was 3 mm., nearly one-half of which was made up of thickened pericardium. At the right of the aorta were masses of caseous glands, adherent to the pericardium. The weight of the heart with the thickened sac was 1110 grams. The chambers were dilated. There was no valvular disease.

The lungs were voluminous, and contained many scattered and conglomerate tubercles, many of which were just beneath the pleura. There were no cavities. The bronchial glands were caseous; diffuse bronchitis. Liver, spleen and kidneys contained tubercles; those in the spleen were large and caseous. There were a few small tuberculous ulcers in the small intestines. The mesenteric glands and glands about the pancreas were caseous.

Meeting of November 21, 1892.

Dr. HURD in the chair. 46 members present.

The Question of the Transmission of Syphilis to the Third Generation.—Dr. HEWETSON.

F. B., aged 21, admitted to hospital (Dr. Osler's wards) June 16, 1891, complaining of pains in the right elbow, right wrist, left shoulder and left knee, with inability to move these joints with any freedom and without pain. The girl's father died of pulmonary tuberculosis; her mother was paralyzed for a number of years, and finally died of dropsy. She is the only child. She was never very robust; had frequent colds, and she states that she had pneumonia at the age of ten, twelve and sixteen years. Four years ago the cough was very severe, and on two occasions she brought up blood, and had night-sweats. She nursed her paralyzed mother for four years and had pretty hard work. She began to menstruate at thirteen, and has been quite regular. She has never had a skin-rash; never had any falling out of the hair. She never remembers to have had pains or swelling in the bones when a child. Eighteen months or two years ago she had inflammation of the left eye, which was very intractable, and about the same time she began to have swelling of the joints. She was working at the time in a damp, draughty room, and the attack was thought to be rheumatism. The left clavicle has been enlarged for more than eighteen months. Four months ago the patient married. At the

time she still had swelling of the joints, and the right eye became involved just before this.

Within the past two years she has lost in weight. She formerly weighed 118 pounds; the last time she was weighed, 96; but when weighed in the hospital a short time after admission, weight was only 81.

Present condition. Thin, spare girl of medium height, and with a remarkably waxy color of the face, and the skin generally glossy and white. The forehead is not especially prominent. There is a frontal boss on the right side. The skull is asymmetrical.

The bridge of the nose is well formed. The upper jaw is prominent, the central incisors a little pegged, the cutting edge narrower than the upper portion, and one presents a slight, very probably artificial, notch. The cornea of the right eye presents a slight but well-marked scar of an old interstitial keratitis; the left is clear. The mucous membranes are pale; the fingers are not clubbed; the muscles are wasted and flabby. There are no glandular enlargements; neither the inguinal, cervical, nor axillary groups present any trace of induration. The most striking feature in the case and the one for which she seeks relief, is the condition of the bones. The left clavicle is very prominent, enlarged in its entire shaft, the skin over it slightly reddened, and it is very sensitive to pressure. There is a large smooth swelling on the outer side of the right arm, three inches in extent, which is a large node involving the right radius. Just at the outer condyle of the right humerus there is also a soft, sensitive, almost fluctuating swelling. The left knee is swollen, especially in the neighborhood of the inner condyle, which seems thickened, enlarged, and very sensitive to pressure. The leg is kept flexed, is very painful, and cannot be fully extended. There does not appear to be much fluid in the joint, but there is a sense of fluctuation in a limited area on the inner side of the patella. There is a slight thickening at the middle of the left tibia, but no distinct node.

The examination of the thoracic and abdominal viscera was negative, with the exception that the spleen was enlarged, and there was very definite increase in the dullness, particularly upwards, extending from the sixth interspace to the lower border of the 10th rib. During the four days during which the patient remained in hospital she had slight fever, the temperature range being between 100° and 101°.

The diagnosis was made of late hereditary syphilis, and she was ordered iodide of potassium, 15 grains three times a day, to be increased gradually. The girl reported again on the sixth of July, at which date the note was as follows:

She feels much better; the waxy color of the face has gone; the change in the nodes is remarkable; the left clavicle is only one-half of its previous size; the node on the right arm has decreased very much. The knee is reduced in size, and is now not very painful. Four days ago a node came out on the seventh left rib in mid-axillary line, and is now swollen and painful.

The patient returned from time to time, and on the 8th of June, 1892, she returned complaining of pain in the left hip, and she was again ordered iodide. She reported at this time that she was pregnant.

She was confined August 9th. The labor was normal. On the 1st of November the patient returned to hospital with her baby, then three months old. She has been very well; is nursing the child. She has for the past two or three months neglected to take the iodide. Two months ago a node appeared on the right forehead, and is now enlarged and tender. The baby was examined on the first and on the sixth of November and showed no trace of disease; is well nourished; has no snuffles; no skin-rash. To-night, as you can see, the node has entirely disappeared from the mother's forehead and her general condition is good, and the child appears to be perfectly healthy.

The patient's husband has been seen and examined. There is nothing in his family or personal history to suggest syphilis and he seems perfectly healthy.

I have looked up as much of the literature as I could get my hands upon, under Dr. Osler's direction, with the following result.

Of the cases which are claimed as positively showing this transmission there are very few, and some leading syphilographers, such as R. W. Taylor, claim that the verdict of "not proven" may be passed on all of them. An analysis of the important cases is given by E. E. King in the Journal of Cutaneous and Genito-urinary Diseases for 1889, where he reported a case of his own; but in the discussion before the American Association of Genito-urinary Surgeons the opinion of those who took part appeared to be that expressed by Dr. Taylor above, viz., "not proven."

Hutchinson, in Reynolds' System of Medicine, says that out of eight cases in which the parent was hereditarily syphilitic, only one had syphilitic offspring.

Fournier, in his work on hereditary syphilis, 1891, says that this transmission to the second generation is very plausible, for if, as we know, the influence of syphilis manifests itself after periods of 15 and 20 years, why should not a young woman hereditarily syphilitic transmit syphilis to her child after the same period of time? He refers to the cases reported by Roberts, Hutchinson, King, Boeck, and Atkinson, but thinks that none are positive enough to establish a scientific fact, and concludes his article on the subject by saying that "the transmission of hereditary syphilis to the second generation is a possible theory, rationally acceptable theoretically, but it has not yet been established as an indisputable fact." The present case is of great interest in that it is a very strong one on the negative side, stronger in many ways than any to which reference has been found. For here we have a young woman who is undoubtedly suffering from hereditary syphilis, and in whom the manifestations are unusually late, becoming pregnant when in the height of the manifestations and bearing a healthy child which she is nursing while she still shows unmistakable signs of the disease. The case will of course be carefully followed up, and any signs of syphilis developing in the child will be reported.

Peritonitis due to Proteus Vulgaris.—Dr. Flexner.

Dr. Flexner presented specimens from a case of peritonitis due to the proteus vulgaris. [To be reported in full later.]

Dr. Welch.—This case, reported by Dr. Flexner, is interesting with reference to the general subject of the relation between peritonitis and Bright's disease. The experiments of Grawitz, Halsted and others have demonstrated that the mere introduction of the ordinary pyogenic cocci into the healthy peritoneal cavity of animals does not suffice to produce peritonitis, but that the co-operation of certain secondary or accessory causes, such as the presence of strangulated tissue, wounds, stagnating fluids, etc., in the peritoneum is necessary in order to enable these bacteria to cause peritonitis. In Bright's disease, both acute and chronic, as well as in cirrhosis of liver and many cases of heart disease, ascites sometimes associated with fibrous thickening of the peritoneum, is a common condition, and this may be regarded as a predisposing or accessory cause of acute peritonitis; but I think that in addition to this we may reckon with a lessening of the vital resistance offered by the tissues and fluids to the growth of pathogenic bacteria. Ascitic fluid, like the blood serum, is possessed of germicidal power, but we can understand that in some cases of Bright's disease or cirrhosis of the liver this germicidal power may be very much diminished or abolished. We have, therefore, as one factor in the causation of acute peritonitis accompanying Bright's disease an already damaged peritoneum with possible reduction of the resistance of the fluids and tissues to bacteria. The other and an essential factor is the entrance into the peritoneal cavity of bacteria capable of causing acute inflammation. Sometimes we can find the portal of entrance of these bacteria in a complicating erysipelas, a leg ulcer, etc., but often the most careful search fails to reveal the point of invasion, and here we are in much the same condition as in our explanations of many cases of acute ulcerative endocarditis engrafted upon an old chronic endocarditis. We must assume that

the bacteria enter the circulation or pass from the alimentary canal without readily demonstrable lesion at the point of invasion. Such bacteria would probably be eliminated or destroyed without doing any harm, if they did not find a damaged tissue or some point in the body where the normal resistance to their growth was lessened. In this way we may explain some of the cases of acute peritonitis secondary to Bright's disease. I have seen a few such cases, both genuine acute purulent peritonitis and acute sero-fibrinous peritonitis, associated with acute and chronic diffuse nephritis, and this group of cases of peritonitis is a recognized one. The peritonitis is then usually a terminal event. That it is not a more common condition is probably due in large part to the germicidal power ordinarily possessed by ascitic and other fluids of the body.

DR. THAYER.—The clinical aspects of the case of peritonitis caused by the proteus were in some ways rather interesting. The girl was brought in on Friday night. She was nineteen years of age, a prostitute, and but little history was obtained. Her friends said that her symptoms dated only three or four days back. The week before she had not been feeling very well. She had several attacks of vomiting, and the physician who saw her said that there was "nothing the matter with her." Within twenty-four hours before she was brought in she became very dull, and on entrance was almost unconscious. At that time was very well nourished; physical examination entirely negative, barring the fact that she was dull and drowsy and could be roused with difficulty. The tension of the pulse was slightly increased, and the second aortic sound was somewhat accentuated. The urine was scanty, of low specific gravity and contained a slight trace of albumen, but no casts could be found on repeated careful examinations. She was given diuretics, pilocarpine and hot-air baths, with very little result. There was scarcely any sweating, and the amount of urine passed was small. She died on Monday afternoon in a convulsion. It is an interesting point that although the urine was examined several times and the centrifugal apparatus used, no casts were found, while examination of frozen sections of the kidneys showed numerous hyaline casts in the tubules.

Primary Tuberculosis of the Intestine.—Dr. FLEXNER.

The child from whom the specimen was obtained was a colored boy 9 years old, who was admitted into the Hospital service of Dr. Osler on October 17th and died October 19th, 1892. His last illness began in April last. His abdomen began to swell, but his appetite kept good and his bowels regular. He had, however, gradually weakened and emaciated. For some months he had had general œdema, and on admission examination of his urine gave the following result: It was clear and yellow in color, specific gravity 1.013, containing faint trace of albumen but no casts.

Autopsy. There was general anasarca, and the abdominal cavity contained several thousand cc. of turbid fluid. The mesenteric glands were greatly enlarged and converted into caseous masses. Inflammatory adhesions had occurred between the glands and the peritoneum covering the mesentery and, corresponding with these, tubercles covered the peritoneum. Beginning 50 cm. below the duodenum there was the first extensive ulceration of the mucous membrane of the intestine. The depth of this ulcer reached the muscular coat, and the ulcer presented an irregular, worm-eaten appearance, its base being covered with necrotic and caseous masses and its edges undermined. At the mesenteric attachment the tissues were much thickened and infiltrated. Such girdle ulcers occurred at varying intervals throughout the small intestine, and sometimes they were separated only a few cm. from one another. Smaller ulcers were also present. They too penetrated at times to the muscular coat. The peritoneal coat of the intestine corresponding with the ulcers contained numerous nodules, some as large as hemp-seed. They were usually yellowish-white and opaque. But smaller translucent point-like tubercles were also present. At the cæcum corresponding with the mesenteric attachment there was a tumor mass measuring 8 cm. in length, closely adherent to the intestine, which on section proved to be a mass of caseous lymphatic glands, more or less united by œdematous fibrous and infiltrated tissues. The mucous membrane of the cæcum was extensively ulcerated; indeed, the entire cæcum, except little islands of mucous membrane which were spared, was a tuberculous ulcer. The appendix was free from ulceration except for a distance of 2 mm. just beyond its junction with the cæcum. The rest of the large intestine was free from ulceration, the rectum excepted, which contained a small ulcer. The solitary follicles of the large intestine were swollen.

The peritoneum generally contained, in addition to the nodules corresponding with the intestinal ulcers, numerous miliary and larger tuberculous nodules. They covered the parietal and visceral layers as well as the peritoneal surfaces of the omentum and mesentery. The retro-peritoneal lymph-glands were enlarged and caseous.

The left lung was firmly bound down by old adhesions; the right pleural cavity contained a large quantity of clear fluid. The apex of left lung contained two wedge-shaped areas of hemorrhage, the bases at the pleura, evidently infarctions, in which were scattered caseous tubercles. At the lower border of the upper lobe there was a retraction of the lung corresponding with a cavity 2 cm. in diameter, the walls of which were composed of granulation tissue, quite recent, and lined with soft necrotic material. This cavity communicated with a bronchus. The right lung contained in its apex a tuberculous area 1.5 cm. in diameter just beneath the pleura. It had not ulcerated. The bronchial glands were pigmented and contained caseous masses.

It does not seem probable that the limited lung tuberculosis could have antedated the intestinal process. I am more disposed to regard the intestinal lesions as the earliest in the body; and a part of the lung lesions, the tuberculous infarctions in the left lung for example, as directly consequent upon these, and would suggest as their origin tuberculous emboli which had gained entrance into the thoracic duct. The other lung lesions may have had a different origin, and perhaps are best regarded as independent infections. I do not know anything but tuberculous food which could have given rise to the condition in the intestine which has been described.

Tuberculosis of Clavicle, Infection of Pleura and Peritoneum, and General Miliary Tuberculosis.—Dr. FLEXNER.

The specimens which I wish to present to-night come from a negro man about 24 years old who died in the City Asylum. He was admitted in a comatose condition a few days before his death, which occurred on November 13th, 1892, and no history was obtained. The autopsy was made 20 hours after death, the body showing no signs of decomposition.

Over the region of the clavicle there was a sinus which led to eroded bone. The walls of the sinus were composed of œdematous granulation tissue, containing yellow caseous masses and covered in part with a purulent and necrotic material. The outer third of the clavicle was eroded for a distance of 3 centimeters, the exposed surface of the bone being roughened and rarefied. A piece of bone almost globular in shape, measuring 2x2 cm., lay almost free in the eroded area and was moveable. Below this fragment there was a distinct depression in the clavicle, containing caseous, necrotic material. The acromio-clavicular articulation was not involved.

The lymphatic glands in the neighborhood were dissected out. The supraclavicular glands were enlarged and contained caseous masses; the glands behind the scapula were not affected. All the glands between the clavicle and the upper border of the pleura on the right side were tuberculous, and some of these were much enlarged and filled with caseous material.

The right costal pleura was much thickened and adherent in large part to the pulmonic pleura. The costal was thicker than the visceral layer. Where the two layers could be separated, miliary tubercles and larger tuberculous masses were present in both. The

base of the lung was separated from the diaphragm by a cavity the size of an orange, filled with a sero-fibrinous exudate. The walls of this encapsulated exudate were formed by the thickened pleura covering the base of the lung, the costal pleura, much thickened, and the upper surface of the diaphragm covered by thickened pleura. Thick flakes of fibrin covered the walls, and on removing this a red granulation tissue containing tubercles was exposed. The whole right lung as well as the left was filled with miliary and conglomerate tubercles, gray in color. The character of the distribution indicated a blood infection. The tubercles in the pleura of the left side corresponded in size and appearance to those in the lungs. The anterior mediastinal glands were enlarged and caseous; the bronchial glands likewise.

The pericardium was adherent to the left pleura, and it contained numerous small tubercles. In the lymphatics (?) of the epicardium rows of small gray tubercles were visible.

The liver was bound down to the diaphragm by old adhesions, and on separating these, caseous tuberculous masses of large size were seen both in the diaphragm and beneath the capsule of the liver. There were numerous tubercles beneath the capsule elsewhere, and on section small and larger tubercles were found in the substance of the liver.

The intestines were bound together by old adhesions containing tubercles and tuberculous masses. These were present in both layers of the peritoneum, and some of the larger tuberculous masses, *e. g.* the size of a hemp-seed, were caseous and calcified, and some pigmented. The mesenteric glands were swollen and caseous. Just above the valve a few gray tubercles were observed just beneath the mucous membrane, the latter at these points being free from ulceration. Below these a few solitary follicles were swollen and ulcerated superficially, and in the cæcum a few small ulcers, quite superficial, existed. In the colon the ulcers were a little larger, passing into submucous coat, the largest one reaching the size of a penny.

The spleen and kidneys contained tubercles.

The course of the infection in the present instance is what renders the case interesting. The primary seat of the tuberculous process was without doubt the bone tuberculosis from which the adjacent lymph-glands and then the right pleura became infected; the infection passing through the diaphragm and affecting the peritoneal cavity long before the general dissemination of tubercle bacilli occurred. This fact is indicated by the old adhesions between the liver and diaphragm, and the size, age and character of the degenerations in the peritoneal tuberculous masses, as well as by the condition brought out by the microscopical examination of the liver, where two distinct processes were observed. The number of tubercles in the liver was large, and one variety was distinctly fibrous, with numerous giant cells and hyaline metamorphosis of a part of the tubercles, while the other were typical miliary tubercles of the freshest kind.

THE INTERNATIONAL CONGRESS OF CHARITIES, CORRECTION AND PHILANTHROPY.

JUNE 12–18, 1893.

Section III on the Hospital Care of Sick, the Training of Nurses, Dispensary Work, and First Aid to the Injured.

One of the series of International Congresses to be held in Chicago in 1893 is to be devoted to the subjects of Charities, Correction and Philanthropy, and the Third Section of this is to consider all matters relating to the Hospital Care of the Sick, the Training of Nurses, Dispensary Work, and First Aid to the Injured. The Committee of Organization of the Congress has appointed Dr. John S. Billings, Surgeon, U. S. Army, as Chairman of this Section, and Dr. Henry M. Hurd, Superintendent of the Johns Hopkins Hospital in Baltimore, as its Secretary, and has authorized and requested them to complete its organization, to extend invitations and to prepare a programme for its work. Miss Isabel A. Hampton, Superintendent of the Training School for Nurses of the Johns Hopkins Hospital, has been appointed Chairman of that part of the work of the Section which relates to the training of nurses.

This Section will hold five sectional meetings of about two hours each, commencing June 12th, 1893, and will also have charge of one of the general sessions of the Congress, viz. that held on the morning of June 14th.

It is desired that this shall be a truly international gathering for conference on the subjects allotted to this Section, and all who are interested in Hospitals, in Training of Nurses, in Dispensaries, or in First Aid to the Injured, are cordially invited to be present, to contribute papers and to take part in the discussions.

The papers and proceedings will probably be printed as a separate volume, and it is hoped that this will represent the best methods and the best work in each of these departments in all parts of the world.

The following are suggested as subjects for special consideration in papers to be prepared:

1st. Hospital Organization—Governing Bodies—Relations of the Medical Staff and of Nurses' Training Schools.

2d. Hospital Finances—Means of Support—Mode of Keeping Accounts—Cost.

3d. Plan and Construction of recently built General Hospitals, embodying the latest improvements.

4th. Relations of Hospitals to increase of Knowledge; to Medical Education, and to the Medical Profession. Hospital Records, Statistics and Reports.

5th. Pay Patients in Hospitals.

6th. Isolating Wards and Hospitals for Contagious Diseases.

7th. Hospital Diets, Dietaries, Kitchens, etc.

8th. Hospital Amphitheatres and Operating Rooms.

9th. Hospital Laundries and Disinfecting Establishments.

10th. Army and Navy Hospitals—Emergency Hospitals in Time of Epidemics—Temporary and Movable Hospitals.

11th. Small and Special Hospitals, Cottage Hospitals, School Hospitals, Private Hospitals, Sanatoriums, etc. Convalescent Hospitals, and what to do with Incurables.

12th. History and present condition of Hospitals in the large cities.

13th. Training Schools for Nurses. (*See special circular.*)

14th. Dispensaries—Relations to the Public and to the Medical Profession. Dispensary Records.

15th. First Aid to the Injured. Associations for best means of popular instruction in and its place in General Education.

Persons desiring to present papers, or to share in the discussions of this Section, are requested to communicate with the Secretary at once. The period of time allotted for the preparation of the programme is necessarily brief, and it is essential that all who are willing to assist in this work should act promptly.

JOHN S. BILLINGS, M. D., *Chairman.*
HENRY M. HURD, M. D., *Secretary.*

SUB-SECTION ON THE TRAINING OF NURSES.

In accordance with the general programme of the Section, Nurses will take part in the general session and in two sectional meetings, and will hold in addition three separate meetings—June 13th, 14th and 17th.

For these three separate meetings papers on subjects of special interest to Nurses will be prepared and discussed. The following are suggested as subjects to select from:

Training Schools in England and America.
Proper Organization of Training Schools.
Nursing in Infirmaries and Almshouses.

Nursing of the Insane. Obstetric Nursing.
Nursing of Infectious Diseases.
Nursing in Sanatoriums and Home Hospitals.
Private Nursing. Nursing by Religious Orders.
Work of Graduate Nurses.

All communications relating to this portion of the work of the Section should be addressed to

MISS ISABEL A. HAMPTON, *Chairman*,
The Johns Hopkins Hospital, Baltimore, Md.

NOTES ON NEW BOOKS.

TWENTY-THIRD ANNUAL REPORT OF THE STATE BOARD OF HEALTH OF MASSACHUSETTS. (*Boston: State Printers*, 1892.)

The State of Massachusetts is to be heartily congratulated upon the valuable work accomplished by its Board of Health as shown by this report. Some of the work is necessarily more or less of local interest, but most of it has a very important general bearing. Many important conditions which affect public health have been investigated in the most careful manner. These investigations have involved a large amount of work, and in some cases the introduction of new and ingenious methods, and the staff of investigators has proved itself fully competent to deal with the often difficult problems involved. The results are all thoroughly trustworthy.

The work of the Board has not been confined to experimental investigation alone, but perhaps an equally important task has been to advise communities, corporations, schools, and private individuals upon questions of public health. In the enlightened community that exists in Massachusetts, advice is often sought in matters of this kind, as is shown in the report, and the Board has been able to do much good in this way. Thus a great number of applications were made for advice as to the best source whence to derive water for public water-supplies, and also as to methods for disposing of sewage and abating public nuisances of all kinds. In short, the Board has been able to give valuable advice in a great many cases where the health and comfort of the community were involved. Owing to the respect and confidence which are felt for the gentlemen composing the Board, the suggestions have been promptly acted upon, and met with warm support and the work thus greatly facilitated.

The systematic examination of the water-supplies of the State, begun in June, 1887, is still continued. It embraces a chemical and microscopical examination. The latter consists of a bacteriological examination and an examination of other minute organisms, plants and animals. The examination of the micro-organisms other than bacteria was made by an ingenious method devised by Professor Sedgewick, and afterwards modified by Professor Rafter, known as the Sedgewick-Rafter method, consisting briefly in filtering a given quantity of the water to be examined through a purified sand-filter, which retains all the organisms other than bacteria, and washing out the sand in a small given amount of distilled water, portions of which are then examined with the microscope after distributing the organisms by agitation.

Very interesting results were obtained by testing for the amount of dissolved oxygen in various lakes, ponds, and reservoirs. It was shown that the oxygen saturates the water on the surface and for ten feet below, and gradually diminishes till at a depth of thirty-five or forty feet or more there is often no longer any oxygen present. Experiments upon the effects of the aeration of natural waters showed that the oxidation of organic matter in water is not hastened by vigorous agitation with air or by air under pressure, but the aeration of water may serve a useful purpose by preventing the excessive growth of algæ, by removing from water disagreeable gases, and by the oxidation of iron in solution.

In the special report on the examination of water-supplies in 1890 it is stated that the amount of chlorine found in spring water is in direct proportion to the density of population, and that this is entirely independent of any direct contamination of the water. This important law has been still further illustrated in a considerable number of samples of spring water collected during the summer of 1891. Some of these springs furnish water that showed a high degree of purity by filtration through the ground even where the water in its course had received a large amount of drainage from sinks, cesspools, privies, or stables. Still the danger of the use of such water is justly emphasized, since at any time an abundant rainfall or an excessive amount of sewage may call for more work on the part of the filtering soil than this is able to accomplish.

The biological examination of the waters brought out the interesting fact that the water at Norwood and Plymouth is infested by a species of uroglena, and that to this are due the bad taste and odor observed in these waters. The organism in question differs from that described by Ehrenberg, and also from that of Bütschli, and has been given the specific name americana. The odor is produced by the disintegration of the colonies.

Experiments conducted for several years show that sewage can be purified by proper filtration through sand to such an extent that it is practically rid of all injurious substances. By intermittent filtration it was shown that many of the filters remove 97.5 per cent. of organic matter and practically all bacteria from 49,300 gallons of sewage per acre of filter surface daily. There are many details in the working of the filters which cannot be entered into here. Results with the filtration of water were equally good. They show that filters can be constructed and operated so as to remove all bacteria from one-and-a-half to two million gallons of water per acre of filter surface per day.

The points above referred to represent some of the more important matters dealt with, and will serve to show the great value of the report. Of somewhat less general interest, perhaps, are special reports upon food and drug inspection, and charts showing the geographical distribution of diseases in Massachusetts. M. B.

UROGLENA EHRBG AS THE CAUSE OF OFFENSIVE ODORS IN WATER SUPPLIES.

Gary N. Calkins, Assistant Biologist of the Board of Health of Massachusetts, describes in the twenty-third annual report of the Board, 1892, the occurrence of an organism related to Volvox, an Uroglena, in the water-supplies of Norwood and Plymouth, Mass. He found that though no odor was observed in the ponds or reservoirs, there was a most objectionable odor in the corresponding tap-waters. He states that the genus Uroglena was as yet almost unknown in America, and was only recently suspected of doing damage to the water-supplies. The organism was carefully studied. It is peculiar to the organism that it, even when present in large numbers in the reservoirs, does not have any smell there, and nevertheless, the corresponding tap-water may smell very badly under entire absence of the organism in it. The author believes that this organism, perhaps often overlooked in many cases, makes the water unfit for drinking. The first time Uroglena was observed in America was in 1889, by Cann, in the waterworks of Middletown, Conn. There also it developed in enormous quantities in the reservoirs, but was absent in the tap-water; nevertheless the first was free of odor, the last had a most objectionable odor. In February, 1892, Buchmaster Pond in Norwood showed the presence of 1300 organisms to every cc. of water. Here, also, a most disagreeable odor and taste were noticed in the tap-water under absence of the organism. The organism itself shows under low power to be a spheroid resembling superficially Volvox. For description of the different species, the life-history, etc., the paper must be referred to the original article. The author describes the following species:

A. Uroglena radiata, n. sp., *seems not to produce any odor.*
B. Uroglena volvox, Bütschli (non Ehrbg), *no odor.*
C. Uroglena americana, n. sp., *causes a disagreeable odor in water.*

Fresh samples of water from the ponds containing great quantities of the organism do not have any odor, but after standing some time the odor appears. The taste is distinctly oily and suggestive of fish. First the colonies break up, then each individual of the colonies disintegrates, and one or more oil-like drops, apparently normally present in the individual, were often seen to escape. The oil was extracted from a great number of colonies with gasoline and ether. These were evaporated, and an offensively smelling oil was so obtained. So probably the taste in the water was due to the liberation of the oil contained in the individuals, and not to their decay, as there was no evidence of decomposition, as shown by bacterial and chemical analysis. The author promises a more complete paper in a future report.

J. P. L.

The Mediterranean Shores of America. Southern California; its Climatic, Physical, and Meteorological Conditions. By P. C. Remondino, M. D., Member of the American Medical Association, etc. (*Philadelphia and London: The F. A. Davis Co.*, 1892.)

This work, as the author distinctly states in his preface, is not intended to be more than a "short guide or abridged hand-book" for the public generally, and not for the medical profession in particular.

Viewed from this standpoint, we must not criticise too closely a few statements which appear not quite in accord with the more recent bacteriological researches. The bearing climate has on the etiology of pulmonary tuberculosis is dealt with at some length, a brief resumé of work done by various writers being given. The conclusion drawn being, that an equable temperature, wherever it may be, ensures the greatest freedom from pulmonary disease. The author then quotes from various reliable statistics to show that such a temperature may be found in many places in Southern California, and explains the great tolerance of the rather high temperature found in some sections by showing the small percentage of humidity present.

He shows Southern California to possess six distinct climates, viz. "the insular, the peninsular, the coast, the foot-hill, the valley and the desert," and the reasons for these are given in a most satisfactory manner. The book is perhaps chiefly valuable to the physician for this fine distinction, as he is able in advising a patient to seek a more suitable home to give more specific directions as regards the locality he may consider the most beneficial.

J. H.

THE JOHNS HOPKINS HOSPITAL REPORTS.

Volume I. This volume is now in press. It will contain the studies from the Pathological Laboratory. The volume will be provided with illustrations. It will be edited by Dr. W. H. Welch, Professor of Pathology and Pathologist to the Hospital.

Volume II.—The second volume of the Hospital Reports began in January, 1890.

CONTENTS.

I. On Fever of Hepatic Origin, particularly the Intermittent Pyrexia associated with Gallstones. By William Osler, M. D.

II. Some Remarks on Anomalies of the Uvula, with special reference to Double Uvula. By John N. Mackenzie, M. D.

III. On Pyrodin. By H. A. Lafleur, M. D.

IV. Cases of Post-febrile Insanity. By William Osler, M. D.

V. Acute Tuberculosis in an Infant of Four Months. By Harry Toulmin, M. D.

VI. Rare Forms of Cardiac Thrombi. By William Osler, M. D.

VII. Notes on Endocarditis in Phthisis. By William Osler, M. D.

VIII. Tubercular Peritonitis. By William Osler, M. D.

IX. A Case of Raynaud's Disease. By H. M. Thomas, M. D.

X. Acute Nephritis in Typhoid Fever. By William Osler, M. D.

XI. The Gynecological Operating Room and the Antiseptic and Aseptic Rules in Force. By Howard A. Kelly, M. D.

XII. The Laparotomies performed from October 16, 1889, to March 3, 1890. By Howard A. Kelly, M. D., and Hunter Robb, M. D.

XIII. The Report of the Autopsies in Two Cases Dying in the Gynecological Wards without Operation. By Howard A. Kelly, M. D.

XIV. Composite Temperature and Pulse Charts of Forty Cases of Abdominal Section. By Howard A. Kelly, M. D.

XV. The Management of the Drainage Tube in Abdominal Surgery. By Hunter Robb, M. D.

XVI. The Gonococcus in Pyosalpinx. By Howard A. Kelly, M. D.

XVII. Tuberculosis of the Fallopian Tubes and Peritoneum. Ovarian Tumor. By Howard A. Kelly, M. D.

XVIII. General Gynecological Operations from October 15, 1889, to March 4, 1890. By Howard A. Kelly, M. D.

XIX. Report of the Urinary Examination of Ninety-one Gynecological Cases. By Howard A. Kelly, M. D., and Albert A. Ghriskey, M. D.

XX. Ligature of the Trunks of the Uterine and Ovarian Arteries as a Means of Checking Hemorrhage from the Uterus, etc. By Howard A. Kelly, M. D.

XXI. Carcinoma of the Cervix Uteri in the Negress. By J. Whitridge Williams, M. D.

XXII. Elephantiasis of the Clitoris. By Howard A. Kelly, M. D.

XXIII. Myxo-Sarcoma of the Clitoris. By Hunter Robb, M. D.

XXIV. Kolpo-Ureterotomy. Incision of the Ureter through the Vagina, for the treatment of Ureteral Stricture. By Howard A. Kelly, M. D.

XXV. Record of Deaths following Gynecological Operations. By Howard A. Kelly, M. D.

XXVI. The Treatment of Wounds with Especial Reference to the Value of the Blood Clot in the Management of Dead Spaces. By William S. Halsted, M. D.

XXVII. A Case of Chorea Insaniens, with a Contribution to the Germ Theory of Chorea. By Henry J. Berkley, M. D.

XXVIII. Acute Angio-Neurotic Œdema. By Charles E. Simon, M. D.

XXIX. Hæmatomyelia. By August Hoch, M. D.

XXX. A Case of Cerebro-Spinal Syphilis, with an unusual Lesion in the Spinal Cord. By Henry M. Thomas, M. D.

XXXI. Amœbic Dysentery. By William T. Councilman, M. D., and Henri A. Lafleur, M. D.

This volume is now completed. It contains 570 pages and 28 plates and figures. It will be furnished, bound in cloth, for $5.00.

Volume II. This volume is now in progress. Subscription $5.00. Price of Part 1, 2, 3 (Report in Pathology II), $2.00.

The Johns Hopkins Hospital Bulletins are issued monthly. They are printed by THE FRIEDENWALD CO., Baltimore, from whom single copies may be obtained; they may also be procured from Messrs. CUSHING & CO. and the BALTIMORE NEWS COMPANY. Subscriptions, $1.00 a year, may be addressed to THE JOHNS HOPKINS PRESS, BALTIMORE; single copies will be sent by mail for fifteen cents each.

ن